

## Abstract

The present invention relates to a turbo decoder having a state metric, a calculating method using the turbo  
5 decoder and a computer-readable recoding medium for executing a calculation method implemented to the turbo decoder. The turbo decoder includes branch metric calculation unit, state metric calculation unit and log likelihood ratio calculation unit. The present invention  
10 may reduce calculation steps by simplifying a conventional turbo decode algorithm, reducing a size of a hardware, which the turbo decoder can be implemented in as an application specific integrated circuit (ASIC) or a field programmable gate array (FPGA). The present invention can  
15 be implemented in an error correction in wireless communication system and satellite communication system.